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THE
QUARTERLY JOURNAL
OF
ECONOMICS

FEBRUARY, 1912

BEET SUGAR AND THE TARIFF

SUMMARY

Twenty-five years ago, little expectation of the growth of a beet-sugar industry, 189. — Great growth since 1890, 191. — Concentration in the far West, 193. — Climatic advantages of the arid region, 195. — Intensive cultivation required, 197. — A large labor supply needed; an agricultural proletariat ? 199. — The sugar manufacturers active in procuring the labor, 202. — Little beet sugar in the Central West, 203. — The explanation is in the principle of comparative cost: corn is more profitable, 204. — The situation in Michigan, 207. — The beet-sugar manufactories, 208. — Can the argument for protection to young industries be advanced ? 212.

Over twenty years ago I published, in the columns of this Journal, a paper in which the tariff was considered in its bearing on certain industries, among them the culture of the sugar beet.[1] The general thesis of the paper was that those industries in which much hand labor is required are not adapted to the economic conditions of the United States; that those in which machinery is much used are carried on here with a comparative advantage; and that the failure of some high duties to bring about the expected domestic production of the protected articles is explicable on the ground that industries requiring much hand labor are carried on here under a comparative disadvantage. This explanation was applied not only to manufactures, but to some phases of agriculture, and among the latter to beet-raising. Notwithstanding high duties on sugar, and a consequent high protection for any sugar-beet industry that might appear in this country, and notwithstanding considerable propaganda, there had been no cultivation of beets, and hence of course no sugar-making; while yet, on the Continent of Europe, the beet-sugar industry had long held its own against cane sugar without any protection whatever. The explanation was found in the fact that beets require intensive cultivation, and, moreover, intensive cultivation of a sort that calls for much hand labor in the fields. American agriculture is usually extensive. Moreover, agricultural machinery is developed and applied to a degree not known elsewhere. The farmers turn to those extensive and machine-using ways of cultivating the soil, especially for grain crops, which they find the more advantageous. Hence they do not raise flax or hemp for fibre, — here also intensive cultivation and hand labor are called for. For the same reasons they do not raise sugar beets, and it is not to be expected that they will.

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[1] " Some Aspects of the Tariff Question," Quarterly Journal of Economics, April, 1889. With some alterations, serving to bring the statistics to later date, the paper was reprinted in several editions of my Tariff History of the United States. In the very last edition of the Tariff History (1910) it was not reprinted, because fuller treat-of recent industrial changes had become necessary than I could then give. The aim of the present paper is to undertake, for the beet-sugar industry, the needed re-examination.

The prediction thus made, or at least implied, has not been verified by the course of events during the last two decades. As is known to every one who has observed the course of the sugar trade, the beet-sugar industry has developed to an extraordinary extent. It began to grow almost immediately after the publication of my paper (1889). The beet-sugar product quadrupled between 1890 and 1900, and more than quadrupled between 1900 and 1910, — a remarkable rate of growth. Far from remaining insignificant and quite negligible, its contribution to the country's sugar supply has become more and more important. In recent years, the beet-sugar output has surpassed that of Louisiana cane sugar, has equalled that from Hawaii, and has itself been surpassed by the supply from one source only, — Cuba.[1] In round numbers, over one billion pounds of beet sugar have been produced in each of the last three years. It would seem that the risks of prediction in economics could not be more dramatically illustrated, or the discomfiture of the prophet more complete.

None the less, I believe that the general reasoning which I applied in 1889 was sound; and not only was the reasoning sound, but its application to the particular case was justified. The unexpected development of the beet-sugar industry is one of those cases in which the apparent exception serves to illustrate and enforce general principles. It is the result of new agricultural and industrial conditions.

The beginnings of this growth of beet-sugar making fall in the period during which the tariff act of 1890 was in effect. Barring a slight amount from one or two California enterprises, no beet sugar at all had been produced before that date. The act of 1890, it will be remembered, admitted sugar free of duty, but gave domestic sugar makers a bounty of two

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[1] The more important contributions to the total sugar supply of the country in 1909-10 (about 7,400 millions of pounds) were, in round numbers, —

from	Cuba	3,500 m. lbs.
"	U. S. Beet Sugar	1,025 " "
"	Hawaii	1,110 " "
"	U. S. Cane (Louisiana)	750 " "
"	Porto Rico	570 " "

cents a pound. It would seem obvious that this put the domestic producers in no better position than before. The previous duty of two cents being abolished, their sugar fell in price by that sum; they simply got the bonus outright, instead of in the indirect form of an enhancement of price. Nevertheless the bounty of 1890 appears to have had a stimulating effect on the beet-sugar industry.[1] There may be a psychological influence from the direct payment; just as there is a vast difference in the effect on people's state of mind between collecting taxes directly and collecting them through levy on producers of commodities, or merchants, who recoup themselves by higher prices. Probably no less effective than the bounty at the start, and more effective as time went on, was the propaganda of the Department of Agriculture. That Department has preached beet sugar in season and out of season; has spread broadcast pamphlets dilating on the advantages of beet-growing for the farmer and giving minute directions on methods of cultivation; has maintained a special agent, who kept in touch with the manufacturers and farmers, and annually reported on the progress of the industry. The result was familiarity with the possibilities throughout the country, the removal of all obstacles from inertia and ignorance, and a rapid development in all regions where there was a promise of profits.

What, now, are the regions in which the profit has been such as to lead to great development? The accompanying tabular statement shows what the situation has been since 1900, — the period during which the growth has been most marked and its geographical distribution most easily followed.

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[1] "It is certain that it [the tariff act of 1890] gave new hope to both operators and growers, and between the time this act went into effect, in October, 1890, and the following June, some $6,000,000 had been invested in beet-sugar factories in this country. . . . This small bounty, even for a brief time, was a wonderful stimulus to the struggling industry." G. W. Shaw, in Bulletin no. 149 (The California Sugar Industry) of the University of California, 1903, p. 17.

On the bounties which several states have given, see the note by Mr. P. T. Cherington, in this Journal, *infra* p. 381.

Beet Sugar Product in the United States
(in million pounds of sugar)

	Total	California	Utah	Colorado	Michigan	Wisconsin	Other States
1899–00	163	85	19	2	33	. .	24
1900–01	172	57	17	13	55	. .	30
1901–02	365	140	28	45	105	6	41
1902–03	438	159	38	78	109	8	46
1903–04	466	136	46	89	128	11	56
1904–05	470	93	57	111	104	22	83
1905–06	635	144	48	209	122	27	85
1906–07	970[1]	178	82	343	177	36	154
1907–08	852	180	93	245	171	37	126
1908–09	1,025	255	98	299	212	34	127
1909–10	1,120	280	77	206	278	36	243
1910–11	1,019	291	76	206	260	38	148

One fact is obvious on a cursory inspection of these figures. The beet-sugar industry is in the main massed in the far West, — in California, Utah, Colorado, and the adjacent region. The agricultural belt of the Central States has a very slender share. Only one state in this part of the country, Michigan, makes a considerable contribution to the supply. Wisconsin adds a very little. No other state in the central region has more than one beet-sugar factory. Barring Michigan, the production of beet sugar may be said to be confined to the Rocky Mountain and Pacific States. In 1909 the four states of California, Colorado, Utah, and Idaho contained 250,000 acres out of a total of 420,000 used for beet culture,[1] and produced nearly 700 million pounds of sugar out of a total of 1000 millions.

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[1] "This large increase was made possible by the unusually favorable weather conditions throughout the campaign." — Willett & Gray.

The explanation of this geographical concentration does not lie in any obstacles from climate or soil in other parts of the country. The beet flourishes over a very wide area. An instructive pamphlet issued by the Department of Agriculture shows the zone in which the sugar beet may be expected to "attain its highest perfection."[2] This zone or belt, two hundred miles wide, starts at the Hudson, and sweeps across the country to the Dakotas; turns southward through Colorado, New Mexico, and Arizona; and then, turning again, proceeds west and northwest through California, Utah, Idaho, and the Columbia valley. It includes a great part of the North Central region. Yet in this, the most important and productive agricultural region of the country, there is virtually no beet-growing or sugar-making, except, as just mentioned, in Michigan. The climatic and agricultural possibilities are not turned to account until the far West is reached.

Two circumstances are dwelt on by those well informed concerning the conditions favorable to beet-growing in this western region: the climate and the special advantages of irrigation.

The variety of the beet suitable for sugar-making flourishes in a cool climate; but it needs plenty of sun. "Abundance of sunshine is essential to the highest development of sugar in the beet. Other things being equal, it may be said that the richness of the beet will be proportional to the amount — not intensity — of the sunshine."[1] Evidently the cool region of cloudless sky in the arid West, including the high-lying parts of Arizona and New Mexico, meets this condition perfectly.

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[1] I derive these figures from the Statistical Abstract for 1910.

[2] The Sugar Beet, by H. W. Wiley (edition of 1908); Farmer's Bulletin 52. The map is at page 5.

Again: "in respect to moisture, the sugar beet is peculiar in some respects. . . . There are three periods in the life history of the sugar beet which demand entirely different treatment so far as moisture is concerned: (1) the germinating or plantlet period; (2) the growing period; (3) the sugar-storing period." During the first "the beet needs sufficient moisture and warmth to germinate and start it, but never an excess." During the second, "the beet needs little if any moisture." During the third, or sugar-storing period, "the plant should be given no water. The conditions desirable at this period are plenty of light and dry cool weather. If the beet is given moisture to any considerable extent, it will be at the expense of both sugar and purity."[2]

It is clear that the irrigated regions of Colorado, Utah, Idaho, Montana, supply just the right combination of climate and moisture: cool temperature, abundant sunshine, moisture as needed, absence of moisture when harmful. Hence Colorado and Utah are described as the ideal beet-sugar states. "Considering everything, Utah is the ideal beet-sugar State. . . . Its natural conditions are quite similar to those of Colorado."[3] In Colorado 12 to 25 tons of beets to the acre are readily secured; even in the early days 15 to 17½ tons were got on the average; whereas in European countries not only is the tonnage per acre less, but the sugar content smaller.[1] Some of the districts of California have the required combination of soil and moisture without irrigation, or with little irrigation. California has some further advantages. Its equable climate enables the beet-sugar "campaign" to be spread over a longer period than elsewhere; and its beets have a very high sugar content.[2]

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[1] Professor G. W. Shaw of the University of California, in the pamphlet on Sugar Beets in the San Joaquin Valley, p. 6; Bulletin no. 176, Agricultural Experiment Station, University of California.

[2] I quote again from Professor Shaw's instructive Bulletin, at pp. 16, 17.

[3] Report on the Progress of the Beet Sugar Industry in the United States in 1909, p. 37, by the special agent of the Department of Agriculture, C. F. Saylor.

Contrast these conditions with those of a state like Michigan, where the annual precipitation is considerable, and where the distribution of the precipitation depends on the accidents of the season. In 1909, for example, the agent of the Department of Agriculture reported that "On the whole the weather conditions in the state during the past year were rather unfavorable. The spring was cold, wet, and backward, but more favorable weather prevailed during the growing season, though there was considerable tendency to drought. The weather was especially favorable for harvesting beets. This is a critical period. Dry weather lessens the work and improves the beets."[3] In 1901, 1902, and 1903 there were bad seasons in Michigan: "there was considerably more rain than was desirable, necessitating expensive work in weeding and cultivation. The cold wet rains of the fall delayed the harvesting and belated the work of the sugar factories."[4] In 1904, on the other hand, the season happened to be favorable.[1] Evidently the Michigan farmer is at a disadvantage because of the uncertainties of the weather. The farmer of the irrigated arid region can always count on abundant sunshine, and can apply moisture exactly as needed.

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[1] Report on Progress . . . 1904, p. 46.

[2] Ibid., p. 22. I take some satisfaction in recalling that, when discussing in 1889 the beet-sugar situation, I referred to the unusual possibilities of such regions as California. "It is not impossible," I wrote then, "that the extraordinary combination of soil and climate in California may bring about a development which could not be attained in other parts of the country." Quarterly Journal of Economics, vol. iii, p. 266, note. A combination of favorable conditions no less extraordinary exists in the arid regions, whose possibilities under irrigation were dreamed of by no one a quarter of a century ago.

[3] Report on Progress of the Beet Sugar Industry in 1909, p. 32.

[4] Ibid., for 1903, p. 139.

For all these reasons "Michigan farmers cannot grow as high a tonnage as they do in the Western States under irrigation; their beets are not naturally of as high a quality and probably they never will be."[2] The same holds of other parts of the North Central region. "In Iowa, the beets have not been as high in quality as those grown in California, Colorado, or Idaho."[3]

Turn now to another aspect of the problem,— the kind of cultivation required for beet-raising. The situation is the same as I described it in 1889. Intensive culture and much hand labor are necessary. Professor Shaw, in his valuable reports on the industry in California, has more than once used the phrase: "The growing of beets is not agriculture, but horticulture." All the manuals and pamphlets insist on the need of elaborate preparation, minute care, much labor directly in the fields. The planting of the seed does indeed take place by drills, the plants coming up in continuous rows. But after this first operation, painstaking manual labor is called for. When the young shoots come up, they need first to be blocked, then thinned. "Blocking" means that all the beets in the rows are cut out by a hoe, except small bunches about ten inches apart. These bunches are then "thinned"; every plant is pulled out by hand except one, the largest and healthiest. "Great care should be exercised in this work, and by careful selection all the inferior plants should be removed. . . . When thinning, it is a good plan to give the ground a thoro hand hoeing."[1] Throughout the growing period the beets must be cultivated, partly with a horse cultivator, partly with the hand hoe. "The cultivator and the hoe should be used alternately until the beets are too large for horse cultivation without injuring them. Hand laborers should continue to go over the beet field, pulling the weeds and grass that may have persisted."[2]

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[1] Ibid., for 1904, p. 113.

[2] Ibid., for 1903, p. 140.

[3] Ibid., for 1904, p. 57.

Essentially the same situation appears when harvesting is reached. The beets may be first loosened by a plow and by a lifter; but each individual beet must be pulled out by hand. Then they are knocked together gently to remove the adhering dirt. Finally, they are "topped"; that is, the neck and leaves are cut off with a large knife. "The removal of the tops of the beets is a tedious process, which in Europe is performed by women and children. . . . Constant supervision is necessary in this work."[3]

No machinery has been devised that serves to dispense with the large amount of hand labor called for. "Several attempts have been made to construct a mechanical device by which the beets can be topped, thus saving a large expense, and perhaps a successful device of this kind may some day be invented. So far as is known at the present time, however, this process has not been successfully accomplished by machinery, and the topping must still be done by hand.[1] " Inventive ingenuity in Europe and especially in America," said the Special Agent of the Department of Agriculture in 1906, " has been directed to planning a harvester which will do away, as far as possible, with this expensive hand work. . . . It cannot be said that any of these newly devised implements works successfully in all soils." [2] In 1909 he reported that " these machines are not now in general use, but their use is increasing "; and he still laid stress on the need of elaborate hand cultivation.[3]

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[1] The Sugar Beet, p. 20.

[2] Report on Progress . . . 1909, p. 19. The same story appears in all the accounts of beet-sugar growing. See for example the statements of Mr. Hathaway, of the Michigan Beet-Sugar Company, before the Committee on Ways and Means in 1909; Tariff Hearings of 1909, p. 3311.

[3] The Sugar Beet, pp. 21, 22.

It follows that the successful growing of the sugar beet calls for a large amount of monotonous unskilled labor; no small part of it, labor that can be done by women and children, and that tempts to their utilization. In the documents of the Department of Agriculture there is constant reference to the peculiar labor problem confronting the farmer who sets out to raise sugar beets. " As a rule the farmer, if he grows beets to any extent, does not have on his farm sufficient labor to take care of the work of thinning, bunching, hoeing, and harvesting the sugar beets." [4] Not only does the typical American farm and farm community lack the number of laborers required; the labor itself is of a kind distasteful to our farmers. " Thinning and weeding by hand while on one's knees is not a work or posture agreeable to the average American farmer. Bending over the rows and crawling along them on one's hands and knees all day long are things that the contracting farmer is sure to object to as drudgery. . . . Our farmers ride on their stirring plows, cultivators, and many implements." [5] As was remarked by one of the witnesses before the Ways and Means Committee, at a tariff hearing: "the thinning and the topping of the beets it is pretty hard to get our American fellows to do, and they prefer to hire the labor and pay for it."[1] The Kansas State Board of Agriculture informs its constituents: "if the American farmer is to realize all possibilities in raising sugar-beets he will do so through his ability as a superintendent and not as a drudge."[2]

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[1] The Sugar Beet, p. 22 (1908).

[2] Report on Progress. . . 1906, p. 38.

[3] Report on Progress. . . 1909, pp. 14, 19.

[4] Report on Progress . . . 1901, p. 19.

[5] Ibid., 1906, p. 24. A correspondent writes me from California: " Otherwise than in the performance of such labor as can be done with teams, very few Americans undertake hand labor in the beet fields."

The manner in which this need of extra labor has been met is instructive not only as regards the beet-sugar situation itself, but also as regards the general trend of industry in the United States during the last generation.

Almost everywhere in the beet-sugar districts we find laborers who are employed or contracted for in gangs; an inferior class utilized and perhaps exploited by a superior class. The agricultural laborers in the beet fields are usually a very different set from the farmers. On the Pacific coast they are Chinese or Mexicans. Except in Southern California, where the Mexicans are near at hand, most of the work is done by Japanese under contract; there being usually a head contractor, a sort of sweater, who undertakes to furnish the men. In very recent years Hindoos (brought down from British Columbia) also have appeared in the beet fields of California. In Colorado "immigrants from Old Mexico compete with New Mexicans (*i. e.*, born in New Mexico), Russians, and Japanese."[3] Indians from the reservation have been employed in Colorado; and boys have been sent out under supervisors from the Juvenile Court of Denver. At one time, convict labor was used in Nebraska.

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[1] Tariff Hearings of 1909, p. 3418. "Americans will not do that work; not 1 in 50," said a Colorado beet grower, testifying (in 1911) before the House Committee to investigate the American Sugar Refining Co.; Hearings, p. 3192.

[2] Report of Kansas State Board of Agriculture for Sept., 1906 (a special report on sugar beets), p. 20.

[3] V. Clark, in Bulletin Department of Labor, Sept. 1908, p. 483.

In some parts of Colorado, in Montana, and at the beet fields of the single factory in Kansas, Russian Germans are employed. These curious and interesting people are Germans who were imported into Russia by the Empress Katherine; they persistently maintained their race and language and religion; in recent years they have been driven from Russia by persecution. They now center about Lincoln, Nebraska, and are shipped under contract to the beet fields, where they are assiduous and much-prized workers. They are much more welcome than the fickle Indians and Mexicans; more welcome even than the Japanese, who are quick and capable, but often break their contracts. The German Russians camp in whole families at the beet region for the summer; men, women, and children toil in the fields. In Michigan, the main labor supply comes from the Polish and Bohemian population of Cleveland, Buffalo, Pittsburgh. The circulars issued by the Department of Agriculture and by the state boards and bureaus repeatedly call the attention of the beet farmers to the possibility of employing cheap immigrants. The troublesome labor problems, it is said, need not cause worry: here is a large supply of just the persons wanted. "Living in cities there is a class of foreigners — Germans, French, Russians, Hollanders, Austrians, Bohemians — who have had more or less experience in beet-growing in their native countries. . . . Every spring sees large colonies of this class of workmen moving out from our cities into the beet fields." [1]

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[1] Report on Progress . . . 1904, p. 37. Compare the Report of the Kansas State Board of Agriculture, cited above, p. 19. A correspondent writes me from Bay City,

The sugar manufacturers, who buy the beets and make the sugar in their factories, play a large part in bringing this labor to the fields. Indeed, they play a large part in every phase of the industry, — on its agricultural side as well as on its manufacturing side. They supply seed; give the farmers elaborate directions on methods of cultivation; employ supervisors to visit and inspect the farms, and to spur the farmers to the needed minute care; of necessity they test the beets at the factory, and pay according to sugar content; and they often undertake to provide the labor. Sometimes the factories contract to attend to the field labor themselves, receiving from the farmers a specified price, — so much for bunching and thinning, so much for each hoeing, so much for topping. The farmers then have nothing to do but supply "reasonable" living accommodations.[1] More often farmers, not thus provided for, secure their laborers through contractors, at a fixed price of so much (varying from $15 to $20) per acre for all the work; these middlemen being hunted up or selected for the farmers by the factory managers. Such "sweaters" make a profit from their sub-contract with the field hands; the system being open to the possibilities of overreaching which are too familiar under such arrangements.

All this is part of the transformation which has been wrought in so many parts of our social and eco-

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Michigan: "We secure the laborers in such centers as Cleveland, Detroit, Chicago, and Pittsburgh, and these laborers when brought to Michigan make a contract with the farmer to take care of his beets at a certain sum per acre, averaging about $20 per acre. . . . It is safe to say that about two-thirds of the beets are taken care of by outside labor. In our own case [a large sugar company] we probably brought in about 1800 laborers." On smaller beet tracts in Michigan, the farmers and their families do the work themselves, employing no "outside" labor.

[1] The form of contract used by the Great Western Sugar Co. of Colorado is printed in the Hearings of the Committee to investigate the American Sugar Refining Co. (1911), p. 3186.

nomic structure during the last quarter of a century by the vast inflow of immigrants. Manufactures have been most obviously affected by it. Our textile trades, the iron and steel industry, the glass manufacture, have in greater or less degree adjusted their methods and machinery to the new labor supply. The tariff situation has been modified: not a few industries can maintain themselves without tariff aid, or with little aid, which formerly could allege more plausibly the need of high duties. Agriculture also is feeling the influence of the new conditions. Laborers from the congested foreign districts of the cities — Italians, Bohemians, "Huns," "Polacks," Russians — make their way to the market gardens surrounding the cities, to vegetable districts such as that of the Chesapeake peninsula, to the cranberry fields of New Jersey, and do the hard work for the shrewd Yankee farmers. Possibly these field hands are on the way to the acquisition of land through their savings. Such persons as the Russian Germans who work in the beet fields are not likely to remain long in their present semi-servile state. These are doubtless progressing toward land ownership. Possibly the same upward movement will be achieved by many members of the other races. But certainly for the time being the conditions are socially and industrially unwelcome. They are not dissimilar to those of the *Sachsengängerei*, of ill repute in eastern Germany. They are very different from the conditions which we think of as typical of agriculture in the United States. There is an agricultural proletariat in the beet fields.

As yet, however, the main agricultural region of the United States, — the great Central region in which are the wheat and corn belts, — has been little affected. Here we still find extensive cultivation, agricultural machinery, the one-family farm. It is true that during the harvest season there is a heavy demand for agricultural laborers, and that this is satisfied by laborers who may be said to constitute an agricultural proletariat. It is true also that the stage of pioneer farming has been passed or is rapidly being passed, that rotation is becoming more systematic and skilful, the land more valuable, cultivation more intensive. Nevertheless this remains the region of the one-family farm. The farmers " ride on their stirring-plows and cultivators " and in this way are able to do most of the work on their lands for themselves.

Throughout the corn belt there is no sugar-beet industry of any moment; yet the corn belt is largely the same as the potential beet-sugar zone. The explanation seems to me clear: it pays better to raise corn. In the language of the economists, there is a comparative advantage in corn-growing. This grain is peculiarly adapted to extensive agriculture. It also lends itself readily to the use of machinery; corn can be " cultivated " between the rows by horse power. It is a substitute for root crops, and can be rotated steadily with small-grain crops.[1] It is a direct competitor with the sugar beet for cattle fattening. The advocates of beet-raising always lay stress on the value of the beet-pulp, the residue at the factory after the juice has been extracted, for cattle feeding. But corn is at least equally valuable for the purpose and the typical American farmer raises it by agricultural methods which he finds both profitable and congenial. One man can grow forty acres of corn. He can plant only twenty acres of beets; and these he cannot possibly thin and top.[1] In Iowa "the farmers are progressive, successful, and satisfied. In fact, this has been the main obstacle to installing the sugar industry there. The farmers have not shown a disposition to grow the beets. When the farmers are advised that beet culture is accompanied with considerable hard work, factory propositions usually succumb to the inevitable. The farming class of the state is accustomed to the use of labor-saving implements in the fields." And yet Iowa "has the quality of soil and the climatic conditions necessary for producing a large tonnage of beets." [2]

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[1] See the excellent analysis by Professor H. C. Taylor, in Annals of the American Academy of Polit. and Soc. Sci., vol. xxii, p. 179 (1903). Cf. the same writer's Agricultural Economics, p. 65 *seq.*, and Carver's Rural Economics, p. 100. Professor Taylor, in a recent paper (The Place of Economics in Agricultural Education and Research, p. 96; publ. by University of Wisconsin, 1911) states more explicitly his conclusion that " it is hardly probable that the sugar beet will ever be able to compete with corn on even terms in the corn belt of the United States."

It is true that Michigan, and Wisconsin also, are outside the corn belt. Except along the southern edge of these states, the grain does not ordinarily mature. But corn still remains a formidable competitor of the sugar beet, in its use through ensilage. It is cut green, stored in the silos, and so is available for cattle feeding. It continues to be available in rotation with other grain and with grass. During the last two decades Wisconsin has become a great dairy state. "The pasture, hay, and corn lands of the state form the basis of the live-stock industry." [3] Here there is a profitable system of agriculture in which there is no need of the minute attention, the elaborate cultivation, the concentrated labor, which are required for the sugar beet.[1]

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[1] Report on Progress . . . 1904, p. 56.

[2] See the testimony of a sugar-beet grower from Colorado, in Tariff Hearings of 1909, p. 3417.

[3] Progress of the Dairy Industry in Wisconsin, by H. C. Taylor and C. E. Lee, p. 7; Bulletin no. 210 of the Agricultural Experiment Station, University of Wisconsin (1911).

To sum up: beet-growing calls for highly intensive cultivation. As I stated in 1889, it is not adapted to the typical agricultural conditions of the United States. On the irrigated lands, where its development has been so surprising, the conditions are not typical. There is likely to be intensive cultivation in any case. The land is comparatively expensive, — counting the cost of irrigation as part of the cost of the land. Hence the land must be called on for a larger gross product, through garden crops and the like. Add the special climatic advantages of the arid region, and it is easy to see why beet culture is found advantageous. But through the greater part of the theoretical beet-sugar belt, and especially in the corn belt, more extensive methods of using the soil pay better. Beet-growing finds no place in the region of the one-family farm.

No doubt it is true that agriculture in the North Central District and to some degree throughout the United States, is in a stage of transition. Corn and the small grains, tho they remain the fundamental crops, are being supplemented by root crops, and there is more and more resort to dairying. How far this transition will be carried must depend on the pressure of demand for agricultural produce in consequence of the growth of population, and on the social forces which influence land ownership and land tenure. The conditions of labor supply are also important; and these may influence the development of agriculture as profoundly as they have that of manufactures. But as yet it is only under exceptional circumstances that the American farmer will find it profitable to carry on such intensive cultivation as beet-growing requires.

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[1] My colleague, Professor T. N. Carver, to whom I showed the proofs of this article, appended the following comment: " Corn silage will furnish fifty per cent more feed, acre per acre, than any root crop. Moreover it costs half as much, or less than half, to grow an acre of silage and feed it as it does to grow an acre of any root crop and feed it. The only chance for beet-root cake is to sell it as a by-product, the balance being covered by the profits on sugar,"

The relation of the beet-sugar industry to the tariff presents, on its agricultural side, one of the many cases of differing costs. If the formula is to be applied which is now so much in vogue — protect in proportion to the higher cost of production in the United States — the legislator must face the dilemma that the protection which suffices for one set of producers *more* than suffices for others, and in that sense is excessive. The situation, of course, is one familiar in the extractive industries, and in all industries in which there are permanent causes of variation in cost. It costs more to produce beets in Michigan and Wisconsin than it does in California and Colorado. The beet-sugar producers of the West can turn out sugar profitably at a price of somewhere near three cents per pound. Those of Michigan find it hard to extract a profit at four cents a pound.[1] The beet-sugar industry of the far West, under the present tariff-raised price of sugar, is steadily reaching eastward with its product, and has become a formidable competitor both of the Michigan industry and of the imported and domestic cane sugar.

[1] See Tariff Hearings of 1909, pp. 3360–3361, and 3325, 3364.

The sugar manufacturer sfrom Michigan who testified before the Ways and Means Committee in 1909 averred insistently that they had been able to declare slender dividends or none at all. The following plaintive letter from a Michigan farmer appears in the Hearings (p. 3500): "Honorable sir: I was one of the first to raise beets in this neighborhood, and each year I have been trying to make up for what I lost the year before. This year I raised in round numbers 13¾ acres, on which I made a profit of minus $2. The crop brought me $504, and it cost me $506, and still I am only 30 miles from the Blissfield factory, where they are marketed." It need not be said that an isolated statement like this has little probative force; what was the method of reckoning "cost"? Yet it is in accord with the general trend of testimony from Michigan.

The Michigan sugar makers hence are uneasy about the future; and they plead strenuously for consideration to their vested interests. It must be admitted that the plea is in one regard of exceptional force. Not only has the general policy of protection been long maintained by Congress, and investment in accord with it encouraged; but, as one of the witnesses before the Ways and Means Committee said in 1909, "the investment which our Company made in the sugar business was made on the invitation and urgent advice of the United States Government through it Department of Agriculture."[1] It is a serious responsibility which the Department has thus taken on itself. Its zeal too often has been indiscriminate. Its propaganda has rested, in part at least, on a crudely mercantilist principle: on the assumption that it is desirable to produce within our own borders anything and everything that can possibly be produced there, and that a tariff policy based on this assumption will be maintained indefinitely.

A question in some respects different is presented by the beet-sugar factory, which buys the beets from the farmers and makes the sugar. Here there is what the business world calls "a straight manufacturing proposition." Whether the manufacturing of sugar can be done to advantage in the United States depends on the same conditions as in other manufactures. It is much affected by the opportunities for using machinery and for the exercise of American inventive and engineering capacity in improving machinery. Such evidence as I can get indicates that, so far as this branch of the industry is concerned, the conditions are not unfavorable to its successful prosecution, with little need, if any, of tariff support. When the first factories were built in California the machinery was imported from Germany. " The Yankee inventive genius of machinery men at once took hold of the matter, making so valuable improvements that both the above mentioned factories [at Watsonville and at Chino] were shortly refitted with machines of American make, and every factory in this country in the last few years has purchased American machines." [1] So in the Department of Agriculture's pamphlet on the industry, it is stated that " in the early days of the beet-sugar industry in this country, Europe was called on to furnish all machinery. Now very little is imported, and in fact some of the foreign factories are using American-made machinery." [2] The domestic making of machinery, the breaking loose from European tutelage, the introduction of technical improvements, — these are significant indications of the successful adaptation of a new industry to American conditions and of ability to meet foreign competition unaided. It should be borne in mind, moreover, that the factory managers take an active part in directing and supervising the agricultural operations. In this regard there seems to be abundant and successful enterprise. The managers of the beet-sugar factories have been chiefly instrumental in bringing the indispensable labor supply to the farms. Through traction engines and the like, they have grappled with the difficulties of transporting the beets from the field to the factory. They have selected the seeds, and have assiduously spread information among the farmers on the best ways of getting a large tonnage of beets and a large content of sugar. In the far West especially, all this activity has been carried on with industrial and pecuniary success. Neither in the factory itself nor in the problems of organization arising from the interdependence of farm and factory has there been a lack of skill or energy.[1]

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[1] Mr. C. N. Smith, in the Tariff Hearings of 1909, p. 3317.

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[1] Shaw, The California Sugar Industry (1903), p. 17.

[2] The Sugar Beet (1908), p. 38. Similar statements have been made to me in conversation by persons engaged in beet-sugar making.

It is, I think, another sign of successful adaptation to new conditions that the American beet-sugar factory carries its operation a stage farther than do the factories of Europe. The latter usually produce raw sugar only, which is sent to the refineries for the last stage of preparation; precisely as our cane sugar is imported in the "raw" form, and goes through the refineries before being marketed for consumption. The American beet-sugar factories, on the other hand, make refined (granulated) sugar, which is sold at once to the grocers. In Europe the greater geographical concentration of beet-growing and sugar-making, and the consequent ease of transportation to refineries near by, probably account for the practice there prevailing. The different American practice doubtless took its start because refining was controlled, during the earlier years of beet sugar, by the Sugar Trust and its affiliated concerns; but it has persisted because it fits the geographical and industrial conditions of the industry. Another reason is that in Continental Europe beet farming and sugar making constitute commonly one integrated enterprise, and are associated either with estate farming on a large scale or with direct coöperation between large-scale agriculturists and the factory owners. A different sort of coöperation between farm and factory was necessary under our conditions of land ownership, and this has been worked out successfully by the American manufacturers. Neither in the technical aspects of the manufacturing industry, nor in its appropriate organization, is there indication of any disadvantages in the United States.

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[1] There is bickering, inevitably, between the farmers who grow the beets and the sugar manufacturers; the farmers maintaining that the manufacturers beat down the growers and pocket the bulk of the profits for themselves. Very likely this is the case; but the growers get quite enough to make the beet culture worth while, as is proved by its rapid extension. See Hearings on the American Sugar Refining Co. (1911), pp. 3313 and passim.

On the agricultural side — to turn again to this, the real seat of difficulty — it is constantly said that sugar beet-growing has many and varied advantages. The high cultivation, it is said, improves the quality of the land; the general fertility of the land is enhanced; a better rotation is established; the by-products, especially the beet-cake, are valuable for cattle feeding, and this in turn provides manure and maintains fertility; the factory makes a market for local coal and lime; it "stimulates banking and almost all kinds of mercantile business." These advantages have been dwelt on almost *ad nauseam* in the publications of the Department of Agriculture.[1] So far as the tariff question is concerned, they prove too much. If beet culture is so very advantageous for the farmer, why does he need a bonus or protective tariff to be induced to engage in it? The American farmer is not an ignorant or stolid person; he has access to a multitude of educational and propagandist agencies, and is even beset by them; he is a shrewd observer, a ready innovator. The agricultural methods of the central region have been revolutionized during the past generation, with the transition from pioneer farming to conserving agriculture. If beet culture were really so advantageous a part of the general change, we might expect its speedy and widespread adoption. I suspect the advocates of beet-growing have been making the same mistake as those English travellers who in the early part of the nineteenth century damned American agriculture as hopelessly inefficient. They suppose that the highest cultivation is necessarily the best cultivation. The agricultural expert is apt to be intent on the gross product, to search for the largest yield per acre. But the best agriculture is that which secures the largest yield not per unit of area but per unit of labor. Minute cultivation means a large product per acre but by no means necessarily a large product per man.

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[1] See for instance Report on Progress . . . 1901, pp. 132 *seq.*

None the less, it may be argued, with show of reason, that the introduction of methods of cultivation so radically novel as those of beet-growing may be prevented from taking place even tho in reality profitable. The young industries argument may be advanced. Ignorance, settled habits and prejudices, unaccustomed methods, the inevitable failures in first trials, all these obstacles, it is said, stood in the way of the beet-sugar industry in its first stages. Some sort of premium was necessary to give it a fair start. It is true that the argument for protection to young industries has not been supposed to apply to agriculture by List and his followers; since unalterable conditions of soil and climate are thought to determine once for all the geographical distribution of the extractive industries. But it would be hazardous to lay down an unqualified proposition of this sort. It is not impossible that the course of industry may be guided and diverted to advantage, in agriculture as well as in manufactures. The difference between the two cases would seem to be simply one of probability, of degree. It can doubtless be said that industry is more *likely* to pursue its " natural " course in the one case than in the other; since agriculture rests mainly on physical adaptation, while in manufactures much depends on acquired skill. In the contemporary German controversy, the young industries argument has been advanced in support of the existing grain duties of that country.[1] It may be argued that, in the far West at least, beet-sugar making has proved its economic advantage. It certainly has passed the experimental stage; and it seems to have reached the stage where protection is no longer needed.

In general, the argument for nurturing protection remains of doubtful validity for agricultural products. In Germany, as in this country, education, experiment stations, diffusion of information adapted to the industrial conditions, are more promising means of promoting agriculture than tariff protection. There is quite as much weight in the counter argument that low prices and the need of facing a difficult situation are effective spurs to agricultural improvement, — more effective than high prices and easy gains. The low prices of raw sugar which prevailed for a long period proved a blessing in disguise to our Louisiana sugar growers: their methods of cultivation and manufacture were immensely advanced in the effort to meet new conditions.[2] It is difficult to give a conclusive or unqualified answer on the questions raised by the young industries argument; the whole problem of the causes of industrial progress is involved. Yet it remains true that acquired skill and established advantage count much more in manufactures than in agriculture, and that tariff protection is a very dubious device for spurring improvement in the use of the soil.

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[1] For instance, by Ballod, in Verhandlungen v. Vereins für Sozialpolitik, 1909, p. 463.

[2] See testimony in the Hearings on the American Sugar Refining Co. (1911), p. 1760.

All this, however, has little bearing on the beet-sugar situation as it now stands. If protection to young industries was needed, it has been given. The initial stages of trial and unfamiliarity are certainly passed. The industry in the far West has quite passed the infant stage. Its difficulties in the farming region proper seem to be due to the competition of the other kinds of agriculture, which under the typical American conditions are more profitable. If this kind of agriculture needs protection, and if the familiar grain-growing, cattle-fattening and dairying, of the corn-wheat belt do not, the explanation is still to be found in the principle of comparative cost.

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